REMARKS

This is intended as a full and complete response to the Final Office Action dated May 20, 2005, having a shortened statutory period for response set to expire on August 20, 2005. Please reconsider the claims pending in the application for reasons discussed below.

Claims 26-28, 30, 35-39, 41, and 46-55 remain pending in the application and are shown above. Claims 26-28, 30, 35-39, 41, and 51-55 stand rejected by the Examiner. Claims 46-50 would be allowable if a Terminal Disclaimer is filed to overcome the double patenting rejection. Claims 26, 35, 51, and 53, and claims dependent thereon have been amended to clarify the claimed embodiments of the invention. Applicants reserve the right to pursue the subject matter of the original claims at a later date. Reconsideration of the pending claims is requested for reasons presented below.

Claim Rejections - 35 USC § 103

Claims 26-28, 30, 35-37, 39, and 41 stand rejected under 35 U.S.C. §103(a) as being obvious over *Chooi et al.* (U.S. Patent No. 6,436,824) in view of *Xia et al.* (U.S. Patent No. EP1050601). The Examiner states that *Chooi et al.* discloses a method for depositing a silicon carbide layer on a substrate but it fails to disclose expressly the claimed ranges and the use of a dopant compound and the details about the dopant. The Examiner further states that it would have been obvious to use the teachings of *Chooi et al.* with *Xia et al.* to obtain the invention as specified in claims 26-28, 30, 35-37, 39, and 41. Applicants respectfully traverse the rejection.

Chooi et al. discloses forming a carbon-doped silicon nitride layer by reacting a substituted ammonia precursor and a substituted organosilane in a plasma enhanced chemical vapor deposition (PECVD) chamber. Alternatively, *Chooi et al.* discloses forming a silicon carbide layer using the substituted organosilanes in a PECVD chamber.

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Xia et al. discloses forming a carbon-doped silicon oxide layer as a premetal dielectric (PMD) or intermetal dielectric (IMD) layer by reacting an organosilane precursor and ozone in a thermal chemical vapor deposition process (thermal CVD), as opposed to a plasma enhanced CVD (PECVD) process. (See, Abstract and paragraph 38.) Thus, *Xia et al.* teaches away from a plasma enhanced CVD process and can not be combine with the PECVD process of *Chooi et al.* In addition, *Chooi et al.* in combination with *Xia et al.* does not teach, show, or suggest any possible combination of the PECVD process of *Chooi et al.* with the thermal CVD process of *Xia et al.* or adding a dopant to a PECVD process.

Applicants have amended claims 26, 35 and claims dependent thereon to recite introducing a processing gas comprising an organosilicon compound and a dopant compound into a plasma enhanced CVD processing chamber and respectfully submit that *Chooi et al.* in view of *Xia et al.*, alone or in combination, does not teach, show or suggest introducing a processing gas comprising an organosilicon compound and a dopant compound into a plasma enhanced CVD processing chamber containing the substrate therein, wherein the organosilicon compound consists essentially of silicon, carbon, and hydrogen, and has a carbon atom to silicon atom ratio of 6:1 or greater, and reacting the organosilicon compound to form a silicon carbide layer having a dielectric constant less than 4, as recited in amended claims 26 and claims dependent thereon.

Further, *Xia et al.* discloses enhancements to the thermal CVD process to be included with the organosilane precursor and ozone for PMD and IMD applications by adding boron or phosphorus dopants. (See, Abstract and paragraph 72.), which requires an organosilane precursor, ozone, and a dopant for a dielectric layer on a thermal CVD process, not a silicon carbide layer for a barrier layer. Thus, *Chooi et al.* in view of *Xia et al.*, alone or in combination, does not teach, show or suggest depositing a barrier layer on the substrate by introducing a processing gas comprising an organosilicon compound and a dopant compound into a plasma enhanced CVD processing chamber containing the substrate therein, wherein the organosilicon compound consists essentially of silicon, carbon, and hydrogen, and has a carbon atom to silicon atom ratio of 6:1 or greater and the barrier layer has a dielectric constant less

than 5, and depositing a first dielectric layer adjacent the barrier layer, wherein the first dielectric layer comprises silicon, oxygen, and carbon and has a dielectric constant of about 3 or less, as recited in amended claims 35 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 51-52 and 54-56 stand rejected under 35 U.S.C. §103(a) as being obvious over *Chooi et al.*, as applied above, in view of *Yang et al.* (U.S. Patent No. 6,365,527). Applicants respectfully traverse the rejection.

Chooi et al. has been discussed above.

Yang et al. discloses treating a silicon carbide layer with an ammonium plasma treatment step. The silicon carbide layer of *Yang et al.* is deposited by reacting an organosilicon compound, such as silane/methane, dimethylsilane, trimethylsilane, tetramethylsilane or other organosilicon precursor gas in a chamber. *Yang et al.* does not teach, show or suggest introducing a processing gas comprising an organosilicon compound and a dopant compound.

Applicants have amended claim 51 and claims dependent thereon to recite introducing a processing gas comprising an organosilicon compound that consists essentially of silicon, carbon, and hydrogen, and has a carbon atom to silicon atom ratio of 6:1 or greater to deposit the silicon carbide layer on the substrate and a dopant into a plasma enhanced CVD processing chamber containing the substrate therein. Therefore, *Chooi et al.*, in view of *Yang et al.*, alone or in combination, do not teach, show, or suggest introducing a processing gas comprising an organosilicon compound that consists essentially of silicon, carbon, and hydrogen, and has a carbon atom to silicon atom ratio of 6:1 or greater to deposit the silicon carbide layer on the substrate and a dopant into a plasma enhanced CVD processing chamber containing the substrate therein, wherein the silicon carbide layer comprises less than about 15 atomic percent of oxygen, and reacting the organosilicon compound to deposit the silicon carbide layer on the substrate, as recited in claim 51 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claim 53 stands rejected under 35 U.S.C. §103(a) as being obvious over *Chooi et al.* in view of *Yang et al.*, as applied above, and further in view of *Xia et al.* Applicants respectfully traverse the rejection.

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Chooi et al., *Yang et al.* and *Xia et al.* have been discussed above. Applicants have amended claim 51 and claims dependent thereon. Therefore, *Chooi et al.* in view of *Yang et al.*, and further in view of *Xia et al.*, alone or in combination, do not teach, show, or suggest all the elements as recited in claim 53. Withdrawal of the rejection is respectfully requested.

Double Patenting Rejection

Claims 46, 48, and 50 stand rejected under judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1, 7 of U.S. Patent No. 6,759,327 and the Examiner states that claims 46-50 would be allowed if a Terminal Disclaimer is filed to overcome the double patenting rejection.

Applicants respectfully submit herewith a terminal disclaimer over U.S. Patent No. 6,759,327. Withdrawal of the rejection and allowance of the claims are respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

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